Thank you for tuning in to the fourth edition of our UNC IMSD newsletter, *The Mosaic*!

We’re only halfway through 2019 yet our IMSD and PREP scholars are unstoppable! We are excited to share many of your excellent work within and outside of UNC. In this issue, we will highlight the awardees of predoctoral fellowships, training grants, and travel awards. We also want to emphasize the importance of scientific communication by listing many of you who attended, gave a talk, or presented a poster at local, national, and international conferences. In addition, you will see the many publications that our IMSD students have published or co-authored in the last few months!

As usual, the IMSD newsletter team strives to be inclusive in highlighting the many achievements of IMSD and PREP students in our community. However, we still need your help in amassing information so we can showcase what our graduate students have done! Keep us informed throughout the semester, and we will happily have you on the next issue.

Stay hydrated,

Team IMSD Newsletter
PhinisheD
Spring 2019 Graduates

Nicole Fleming, PhD
“Molecular Regulation of Cardiac Development and Disease”
February 4, 2019
Mentor: Jiandong Liu, PhD

Sabri Abdelwahab, PhD
“Characterizing the Effect of New and Emerging Tobacco Products on the Airway Innate Mucosal Defense”
March 18, 2019
Mentor: Mehmet Kesmier, PhD

Samantha “Pixie” Piszkiewicz, PhD
Research area: Biophysics of Enzyme Dessication Tolerance in Tardigrades
April 12, 2019
Mentor: Gary Pielak, PhD

Christina Parker, PhD
Research area: Design and testing of novel bispecific antibodies for targeted delivery of nanoparticles and lentiviruses
May 9, 2019
Mentor: Samuel Lai

Veronica Murphy, PhD
“Early Brain Development in Children at Risk for Schizophrenia”
May 8, 2019
Mentor: John Gilmore, PhD

IMSD Welcomes Two New Co-PIs!

Dr. Rita Tamayo and Dr. Thomas Kash were officially introduced as co-principal investigators for the IMSD grant at the IMSD townhall meeting. If you have not had the chance introduce yourself, try to catch them at the next IMSD event!

IMSD Alumni Corner

Dr. Vivien Maltez, formerly a member of the Miao lab and now a post-doc in Dr. Ronald Germain’s lab at NIH, recently received an intramural Postdoctoral Research Associate Training fellowship. Each year, approximately 6-8 PRAT fellowships are awarded to intramural post-docs across all NIH institutes. The fellowship provides funding in addition to a structured leadership, career development, and networking platform for each year’s cohort.

Dr. Pedro Pozo from the Cook lab will become a postdoctoral fellow at MIT in Cambridge, MA beginning in August!
Megan Justice (Dowen Lab) and Carolina Herrera (Falk Lab) were selected as Yale Ciencia Academy fellows for 2019! The Yale Ciencia Academy is a community of graduate students, mentors, and scientists who collectively aim to contribute to their communities through science outreach. Fellows will have the opportunity to develop their professional skills for career advancement through different workshops, science outreach and leadership, and the annual meeting for the American Association for the Advancement of Science conference.

Through this program, they met Jaylissa Torres Robles (Yale), Cecilia Hinojosa (Tufts), Carlos Perez-Kerkvliet (University of Minnesota), and Adriana Mulero-Russe (Georgia Institute of Technology). Together, the team formed the You CAN do STEM community on YouTube and Facebook group. Their mission is to empower, inspire, and support high school and college students to pursue STEM careers by sharing their own experiences from their diverse backgrounds. They offer advice on various opportunities in STEM such as funding and summer research experiences and how to navigate potential obstacles such as tests, application processes, mentorship and more! If you know someone interested in learning more about a career in STEM, you can pass along their social media links in addition to some of their advice below:

Megan (left): Take some risks! Don't be afraid to do a rotation in a lab whose science is a bit foreign to you. I would have never found my true interest if I stuck with what I knew coming from undergrad!

Carolina (right): Immerse yourself in as many research opportunities you can before applying to grad school and follow your passion.

Cecilia (not pictured): Perseverance is everything, always remember why you chose to pursue your graduate degree. There will be times when you feel like

**Currin Lands an ImPACT Internship**

Kevin Currin (Mohlke Lab) received an ImPACT internship award. He is working/worked at SAS Institute, Inc in Cary, NC with the SAS accessibility team to expand the functionality of the SAS Graphics Accelerator for working with high-dimensional data.

**IMSD Scholars at Conferences**

Kia Perez Vale (Peifer Lab) was invited to give a talk at the Gordon Research Seminar and Conference on Cell Contact and Adhesion held in Les Diablerets, Switzerland detailing her work how “Canoe/Afadin and Polychaetoid/ZO-1 act in parallel to maintain epithelial integrity when challenged by adherens junction remodeling during embryogenesis.”

Several IMSD students in the Curriculum in Toxicology & Environmental Medicine attended the Society of Toxicology Meeting in Baltimore, MD. Eva Vitucci (McCullough Lab) received the Society of Toxicology In Vitro & Alternative Methods Graduate Student Award and presented her work on “Piecing Together the Puzzle: Identifying the Role Oxidative Stress and the Alveolar Epithelium Play in Air Pollution Induced Cardiovascular Disease.” Jessica Jimenez (Zylka Lab) was the recipient of the 2019 Perry J. Gehring Student Travel Award and presented her work on "Environmental Impact on Health Through the Lens of Brain Microglia.” Yael Escobar (Jaspers Lab) received a travel award from the Hispanic Organization of Toxicologists to present her work on “Analyzing the Cellular Stress Response in Airway Epithelial Cells to Vaporized Propylene Glycol and Glycerol.” Kevin Mauge-Lewis (Fenton Lab) presented on the “Effects of 10 New Generation PFAS-Containing Aqueous Film Foams (AFFF) on Human Liver Cell Viability.”

Kandace Thomas (Brennan Lab) received American Heart Association Travel award and presented her work on “Developmental Dynamics of Cardiac Pacemaker Cell Cytoarchitecture” at the Weinstein Conference in Indianapolis, IN.
**IMSD Scholars at Conferences**

**Jared Baisden** (Zhang Lab) presented on “Unveiling A Rare Conformational State That Modulates Biogenesis of an Oncogenic MicroRNA,” at the 60th Experimental Nuclear Magnetic Resonance Conference in Pacific Grove, CA.

**Alex Stutzman** (McKay and Dowen Labs) presented work on “Mapping 3-dimensional genome architecture in developing Drosophila melanogaster tissues” at the Triangle Fly Symposium here in NC.

**Ricardo Rivera-Soto** (Damania Lab) received a Carl Storm Underrepresented Minority Fellowship and UNC Graduate School Transportation grant to attend the Viruses and Cells, Gordon Research Seminar and Gordon Research Conference in Barga, Italy. There, he presented on “KSHV viral Interleukin-6 Induces Expression of Integrin β3 in Endothelial Cells.”

**Carolina Herrera** and **Christian Agosto-Burgos** (Falk Lab) both attended the International Vasculities & ANCA Workshop in Philadelphia, PA. Carolina gave a talk and showed a poster on her work describing the “Activation of Neutrophils with MPO-ANCA correlates with MPO autoantigen gene expression.” Christian presented his work on “Characterization of Low-Density Granulocytes During ANCA Vasculitis.”

**Adelaide Tovar** (Kelada Lab) received the Minority Trainee Development Scholarship from the American Thoracic Society and presented her work titled, “Investigating Susceptibility to Ozone-Induced Lung Inflammation and Injury Using the Collaborative Cross Mouse Genetic Reference Population”.

**Juanita Limas** (Cook Lab) was selected to give a talk on “A Novel Way of Blocking Origin Licensing and Recapitulating Early Oncogene Activation” at the Gordon Research Seminar “Cell Growth and Proliferation.” She also presented this work at the associated Gordon Research Conference in West Dover, VT.

**Carissa Harvest** (Miao Lab) received a poster award for presentation of her work on “A novel granuloma model” at the Duke Innate Immunity Group Symposium.

**Karel Alcedo** (Snider Lab) was awarded the UNC Transportation Grant to attend the EASL International Liver Congress in Vienna, Austria and present a poster about her research entitled “Site-specific structural N-glycan alterations limit CD73 nucleotides activity in human hepatocellular carcinoma.”

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**Awards & Fellowships**

**NSF Graduate Research Fellowship**
- Jennifer Loome (Heise Lab)

**NRSA Individual Predoctoral Fellowship (F31)**
- Kia Perez Vale (Peifer Lab)
- Kevin Currin (Mohlke Lab)

**Cancer Cell Biology Training Program**
- Karel Alcedo (Snider Lab)

**NCI Pre- to Postdoctoral Transition Award (F99/K00)**
- Megan Agajanian (Major Lab)

**HHMI Gilliam Fellows**
- Brea Hampton (Heise and Ferris Labs)
- Andrew Hinton (Mucha and Burks Labs)
- Sheilsa Marcel (Davis and Furey Labs)
- Kristina Rivera (Magness Lab)

This year, FOUR graduate student-advisor pairs from UNC were selected for the HHMI Gilliam Fellowship. This fellowship not only provides funding to the student, but also to the advisor to sponsor initiatives at the graduate level to diversify the professoriate.
Publications


Kevin and colleagues defined genetic regulatory elements in fat cells and showed how those regulatory elements can be used to identify the mechanisms by which genetic variants affect disease risk.


During morphogenesis cells need to change shape and move while maintaining tissue integrity. We find that the cell junction-cytoskeletal linker proteins Canoe and Polychaetoid, homologs of mammalian Arafad and ZO-1, work in parallel to maintain the integrity of tissues that challenged by events requiring cell junction remodeling.


This study demonstrated that the lengths of cell cycle phases are set independently of one another.


This review summarizes the current body of knowledge pertaining to human immune responses to gonococcal infections and the role of these responses in mediating protection from N. gonorrhoeae.


We showed that caspase-11 activation controls genital Chlamydia infection independent of caspase-1.


Alteration of mGluR1/5 has been implicated in neurological disorders, which show abnormal sleep phenotypes. Here, they present a model where Homer modulates mGluR1/5 signaling during sleep-wake cycle.

Abnormalities in white matter have been observed in patients with schizophrenia. This study provided evidence of abnormal development of the white matter in the hippocampal segment of left cirumulus in children at risk for schizophrenia.


This study provides a new model to evaluate the spatiotemporal shape changes over time to determine anatomical growth or degeneration.


Meprin metalloproteases are implicated in the pathogenesis of diabetic nephropathy. Here, we show that the deficiency of meprin β in mice altered distinct metabolic profiles in the kidney, suggesting its contribution to diabetic kidney injury.


We studied the behavior and cortical activity of mice exposed to stress induced by predator odor TMT. We show that the neuropeptide CRF1 drives synaptic changes in neurons located in the prelimbic subregion.


This study identified a type of neurons that is necessary for the reward behavior but not the promotion of feeding of palatable food.


This is a review on different cell culture models used to study axon pruning and cell death. They highlight the overlap and distinct signaling mechanisms that are at play.


Apoptosis or cell death plays a significant role in the neuronal development during embryogenesis. After differentiation into post-mitotic neurons, cell death is inhibited. This review highlights the mechanisms of survival of post-mitotic neurons.


We developed an assay to identify nontuberculous mycobacteria species that can be adaptable for diagnostic laboratories in the health clinic.


We demonstrated that immunotherapy for peanut allergy induces plasma IgG changes that are associated with clinical outcomes.


We described an in vivo implantation method that enables us to examine how the microenvironment can influence cell fate and function of embryonic cardiomyocytes.


We describe the development and application of a novel series of vectors called CRISPR-Bac that facilitate CRISPR-Cas9-mediated genome editing in mammalian cells.


This review highlights the characteristics of T cells from HIV-positive patients under antiretroviral therapy.

Yu W, Hwa LS, Makhijani VH, Besheer J, Kash TL. “Chronic inflammatory pain drives alcohol drinking in a sex-dependent manner for C57BL/6J mice.” Alcohol. 2019 Jun;77:135-145. PMID: 30300665 PMCID: PMC6451680

Our findings show that male mice undergoing pain are more susceptible to increased alcohol intake compared to their female counterparts, highlighting the relationship between chronic pain and alcohol abuse.
Stay connected to IMSD!

This is PREP10! Pictured from left to right: Ryann Callaghan, Aleah Bailey, Sarah Magee, Nicole Rivera-Espinal, Pedro Martinez-Barbosa, Shaka X, Eden Cruikshank, Maria Gonzalez, and Jhoan Aguilar.

IMSD Welcomes PREP 10!

Ryann Callaghan from Drew University is in the lab of Aaron Anselmo.

Aleah Bailey from Rutgers University is in the lab of Ilona Jaspers.

Sarah Magee from Penn State University in the lab of Melissa Herman.

Nicole Rivera-Espinal from University of Puerto Rico Cayey is in the lab of Jimena Giudice.

Pedro Martinez-Barbosa from University of Puerto Rico Arecibo is in the lab of Helen Lazear.

Shaka X from Boston University is in the lab of Victoria Bautch.

Eden Cruikshank from University of North Florida is in the lab of Doug Phanstiel.

Maria Gonzalez from University of Puerto Rico Cayey is in the lab of Graham Diering.

Jhoan Aguilar from UNC Chapel Hill is in the lab of Donita Robinson.

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